

U.S. Patent Application Serial No. 10/820,345
 Reply to Office Action dated May 3, 2007

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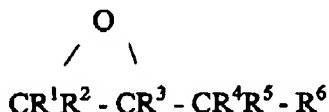
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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A pigment comprising pigment particles reacted with an epoxy compound in the presence of a solvent for dispersing the pigments wherein a discrete powder form of the surface treated pigment particles can be obtained by virtue of drying of the solvent so as to provide a surface treatment of the particle, the epoxy compound having a general formula:



wherein R¹, R², R³, R⁴ and R⁵ are each, independently, hydrogen, or substituted or unsubstituted alkyl, or, R² and R⁴ may be taken together to form a 5-7 membered ring, and

R⁶ is hydrogen, -OOCR⁷, -OR⁸, -OOC-CR⁹=CR¹⁰R¹¹, a monoepoxy or polyepoxy group containing diphenyl, phenyl, or substituted or unsubstituted alkyl or cycloalkyl, or a monoepoxy or polyepoxy group containing a polyether group,

R⁷, R⁸, R¹⁰ and R¹¹ are each, independently, hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, or substituted or unsubstituted alkenyl,

R⁹ is hydrogen, or alkyl,

with the proviso that the epoxy compound has no silicon-containing group.

2. (Previously presented) The pigment as claimed in Claim 1, wherein the epoxy compound has an epoxy equivalent weight of less than 1000.

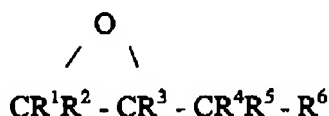
3. (Previously presented) The pigment as claimed in Claim 1, wherein the epoxy compound is selected from a group consisting of glycidyl ethers, glycidyl esters, cycloaliphatic epoxy compounds, and cycloaliphatic diepoxy compounds.

4. (Previously presented) The pigment as claimed in Claim 1, wherein the epoxy compound is selected from a group consisting of glycidyl methacrylates and glycidyl acrylates.

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5. (Currently Amended) A pigment dispersion comprising:

a dispersing agent, and a pigment dispersed in the dispersing agent, wherein particles of the pigment are reacted with an epoxy compound in the presence of a solvent to provide a surface treatment of the particles, wherein a discrete powder form of the surface treated pigment particles can be obtained by virtue of drying of the solvent, the epoxy compound having a general formula:



wherein R^1 , R^2 , R^3 , R^4 and R^5 are each, independently, hydrogen, or substituted or unsubstituted alkyl, or R^2 and R^4 may be taken together to form a 5-7 membered ring, and

R^6 is hydrogen, $-\text{OOCR}^7$, $-\text{OR}^8$, $-\text{OOC}-\text{CR}^9=\text{CR}^{10}\text{R}^{11}$, a monoepoxy or polyepoxy group containing diphenyl, phenyl, or substituted or unsubstituted alkyl or cycloalkyl, or a monoepoxy or polyepoxy group containing a polyether group,

R^7 , R^8 , R^{10} and R^{11} are each, independently, hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, or substituted or unsubstituted alkenyl,

R^9 is hydrogen, or alkyl,

with the proviso that the epoxy compound has no silicon-containing group.

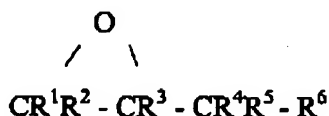
6. (Original) The pigment dispersion as claimed in Claim 5, wherein the epoxy compound has an epoxy equivalent weight of less than 1000.

7. (Previously presented) The pigment dispersion as claimed in Claim 5, wherein the epoxy compound is selected from group consisting of glycidyl ethers, glycidyl esters, cycloaliphatic epoxy compounds, and cycloaliphatic diepoxy compounds.

8. (Original) The pigment dispersion as claimed in Claim 5, wherein the epoxy compound is selected from a group consisting of glycidyl methacrylates and glycidyl acrylates.

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9. (Original) A method of surface treating pigment particles, comprising:
 mixing the pigment particles with an epoxy compound in the presence of a solvent to form a slurry; and
 causing the pigment particles to react with the epoxy compound at an elevated temperature wherein a discrete powder form of the surface treated pigment particles can be obtained by virtue of drying of the solvent,
 wherein the epoxy compound has a general formula



wherein R^1 , R^2 , R^3 , R^4 and R^5 are each, independently, hydrogen, or substituted or unsubstituted alkyl, or R^2 and R^4 may be taken together to form a 5-7 membered ring, and

R^6 is hydrogen, $-\text{OOCR}^7$, $-\text{OR}^8$, $-\text{OOC}-\text{CR}^9=\text{CR}^{10}\text{R}^{11}$, a monoepoxy or polyepoxy group containing diphenyl, phenyl, or substituted or unsubstituted alkyl or cycloalkyl, or a monoepoxy or polyepoxy group containing a polyether group,

R^7 , R^8 , R^{10} and R^{11} are each, independently, hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, or substituted or unsubstituted alkenyl,

R^9 is hydrogen, or alkyl,

with the proviso that the epoxy compound has no silicon-containing group.

10. (Original) The method as claimed in Claim 9, wherein the epoxy compound has an epoxy equivalent weight of less than 1000.

11. (Previously presented) The method as claimed in Claim 9, wherein the epoxy compound is selected from a group consisting of glycidyl ethers, glycidyl esters, cycloaliphatic epoxy compounds, and cycloaliphatic diepoxy compounds.

12. (Original) The method as claimed in Claim 9, wherein the epoxy compound is selected from a group consisting of glycidyl methacrylates and glycidyl acrylates.

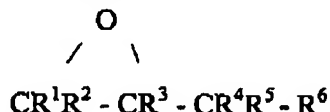
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13. (Original) The method as claimed in Claim 9, further comprising the step of removing the solvent and drying the pigment particles treated with the epoxy compound.

14. (Previously presented) The pigment of claim 1 wherein the reaction of pigment particles with the epoxy compound forms a thin layer on the pigment surface.

15. (Previously presented) The method of surface treating pigment particles according to claim 9 wherein the reaction of pigment particles with the epoxy compound forms a thin layer on the pigment surface.

16. (New) A pigment comprising pigment particles reacted with an epoxy compound in the presence of a solvent for dispersing the pigments to provide a surface treatment of the particles wherein the epoxy compound forms a discrete layer on the pigment surface, the epoxy compound having a general formula:



wherein R^1 , R^2 , R^3 , R^4 and R^5 are each, independently, hydrogen, or substituted or unsubstituted alkyl, or R^2 and R^4 may be taken together to form a 5-7 membered ring, and

R^6 is hydrogen, $-\text{OOCR}^7$, $-\text{OR}^8$, $-\text{OOC}-\text{CR}^9=\text{CR}^{10}\text{R}^{11}$, a monoepoxy or polyepoxy group containing diphenyl, phenyl, or substituted or unsubstituted alkyl or cycloalkyl, or a monoepoxy or polyepoxy group containing a polyether group,

R^7 , R^8 , R^{10} and R^{11} are each, independently, hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, or substituted or unsubstituted alkenyl,

R^9 is hydrogen, or alkyl,

with the proviso that the epoxy compound has no silicon-containing group.

17. (New) The pigment of claim 16, wherein the epoxy compound has an epoxy equivalent weight of less than 1000.

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18. (New) The pigment of claim 16, wherein the epoxy compound is selected from a group consisting of glycidyl ethers, glycidyl esters, cycloaliphatic epoxy compounds, and cycloaliphatic diepoxy compounds.

19. (New) The pigment of claim 16, wherein the epoxy compound is selected from a group consisting of glycidyl methacrylates and glycidyl acrylates.

20. (New) The pigment of claim 16 wherein the reaction of pigment particles with the epoxy compound forms a thin layer on the pigment surface.